

A SLIDE FASTENER

FIELD OF THE INVENTION

The present invention relates to a slide fastener, in particular a slide fastener in
5 which the fastener tapes are joined one above the other.

BACKGROUND OF THE INVENTION

Slide fasteners are broadly divided into two types: those that use rows of teeth
and those that use coils for the engagement part. While it is known that the former type
10 has been widely used, the use of the latter type has also been increasing recently.
Embodiments of the latter type include JP-47-29135B, US-5,596,793B and JP-2000-
197508A.

Whether rows of teeth or coils are used, conventional slide fasteners consist of
a pair of fastener tapes that are joined on the same plane. According to this method, it is
15 difficult to attach fastener tapes at locations other than the edges of fabrics. If fastener
tapes T are attached at locations other than the edges of fabrics F, as shown in FIG. 8,
tapes T rise perpendicularly to the fabrics F, resulting in a thick and clumsy fastener.

If fastener tapes can be attached elegantly at locations other than the edges of
fabrics, it is possible to incorporate a fastener at a location previously inconceivable.
20 Such a fastener has a variety of applications, for embodiment, a garment of an
extraordinary design.

SUMMARY OF THE INVENTION

In order to attach fastener tapes at locations other than the edges of fabrics and
25 not make them unnatural, the fastener tapes need to be joined one above the other. The
object of the present invention is to provide such a slide fastener and fastener tapes and
a slider that can be used in such a fastener.

The present invention is a slide fastener comprising a pair of fastener tapes
each having a fastener element for engagement and a slider for closing and opening said
30 fastener tapes. The fastener elements, which function as the engagement part, protrude
from the respective tapes. A protrusion on one tape engages with a complementary
protrusion on the other tape thereby joining the pair of fastener tapes one above the
other.

The slide fastener tapes used in the present invention can have a fastener element established at the edge of each fastener tape or at a location other than the edge. Establishing a fastener element at a location other than the edge has the advantage of making the engagement part invisible from the outside.

5 The fastener element can be made of a coil or a row of teeth. Generally, however, a coil is preferable because it is easier to make a coil protrude from the tape than a row of teeth.

 As a method for securing a coil or a row of teeth to the tape, any of known methods can be used. For embodiment, in order to secure a coil to the tape, the
10 following steps can be taken as disclosed in any of the publications cited above:
 (1) having a core string run through a coil made of thermoplastic synthetic resin;
 (2) stitching the coil to the edge of the tape with a synthetic fiber thread; and
 (3) thermally welding the synthetic fiber thread to the tape.

 The slider used in the present invention has a guide column and a top plate and
15 a bottom plate provided above and below said guide column. One end of the top plate extends downward, forming a left side part, while the other end extends to an open space. One end of the bottom plate extends upward, forming a right side part, while the other end extends to an open space. Left and right fastener-element housings are formed between the guide column and the left and right side parts.

20 The slider preferably has a pull that is attached in the form of a projection established on a side of the slider body. If it is difficult to grip the pull, a string can be provided so as to connect the hole of the pull with a hole established at the tip of the slider body.

25 BRIEF DESCRIPTION OF THE DRAWINGS

 Embodiments of the present invention will now be explained with reference to the accompanying drawings, in which:

 FIG. 1 is a front view of a part of a slider fastener according to the first embodiment of the present invention showing the engagement part and the slider;

30 FIG. 2 is a cross sectional view taken along line II-II of FIG. 1. (a) shows a disengaged condition; (b) shows an engaged condition;

 FIG. 3 is a plan view showing an engaged condition of the left and right fastener elements;

FIG. 4 shows (a) a front view, (b) a plan view and (c) a side view of the slider of the present invention;

FIG. 5 shows an engaged condition of the fastener elements 10 and the slider 20. (a) is a cross sectional view and (b) is a plan view in which the tapes are partially held apart;

FIG. 6 is a front view of a part of a slider fastener according to the second embodiment of the present invention showing the engagement part and the slider;

FIG. 7 is a cross sectional view taken along line VII-VII of FIG. 6. (a) shows a disengaged condition, and (b) shows an engaged condition; and

FIG. 8 is a cross sectional view of a conventional slide fastener used at a location other than the edges of fabrics.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

<First Embodiment>

FIG. 1 is front view showing the engagement part and a slider of a slide faster according to a first embodiment of the present invention. FIG. 2 shows cross sectional views taken along line II-II of FIG. 1. (a) shows a disengaged condition while (b) shows an engaged condition. FIG. 3 is a plan view showing a condition in which the left and right fastener elements are engaged.

As evident from these drawings, the engagement part in this embodiment comprises coil fastener elements 10. As shown in FIG. 1, these coils 10 are longitudinally established at an approximate center of each tape 12 rather than at edges of the tapes.

The coils 10 can be secured to the tapes 12 by means of a known technique. For embodiment, as disclosed in any of the publications cited above, such a technique may comprise the following steps:

- 1) having a core string 14 run through the coil 10, which is made of thermoplastic resin;
- 2) stitching the coil 10 to the edge of the tape 12 with a synthetic fiber thread 16; and
- 3) thermally welding the synthetic fiber thread 16.

If the coil is at the edge of the tape, an ordinary slider can be used to fasten or unfasten the engagement part. In this embodiment, however, the coil is positioned at the center of the tape, so an ordinary slider cannot be used for fastening or unfastening.

This embodiment, therefore, uses a novel slider 20 as shown in FIG. 4. This

slider comprises a guide column 22 and a top plate 24 and a bottom plate 26 provided above and below said guide column. The left end of the top plate 24 extends downward, forming a left side part 24a, while the right end extends to an open space 24b. The right end of the bottom plate 26 extends upward, forming a right side part 26a, while the left end extends to an open space 26b. Between the guide column 22 and the left and right side parts 24a, 26a, left and right housings 28, 30 for fastener elements are formed. The left and right housings 28, 30 are shaped so as to become wider as they extend downward.

In an ordinary fastener, a pull is established on a top plate 24. In this embodiment, two pulls 32, 34 are established adjacent the left and right side parts 24a, 26a of the slider body. These pulls 32, 34 are plate-shaped projections provided with holes 32a, 34a in the center. If it is not easy to clasp these projections, a string 38 (see FIG. 1) can be provided so as to connect the holes 32a, 34a with a mounting hole 36a provided at the tip of the slider body 36. In this case, the string 38 is clasped by fingers to move the slider 20 up and down. In this embodiment, the pulls 32, 34 are established on the left and right sides of the slider 20. In practice, one pull should be sufficient, but by providing pulls on both sides, either a right-handed or a left-handed person can handle the slider with ease.

The engagement between the coils 10 and the slider 20 is most graphically illustrated in FIG. 5. As shown in FIG. 5 (a), the left and right fastener elements (i.e., coils) 10 pass through the left and right housings 28, 30. At this time, the top plate 24 of the slider moves under the upper tape and the bottom plate 26 of the slider moves on the lower tape 10 in such a way that it pushes down the lower tape 10. FIG. 5 (b) is a partially cut off side view illustrating this condition.

In this way, the two portions of the slider fastener of the present invention are joined one above the other as shown in FIG. 2 (b).

<Second Embodiment>

FIG. 6 is a front view of a part of a slider fastener according to a second embodiment of the present invention showing the engagement part and the slider. FIG. 7 is a sectional view taken along line VII-VII. of FIG. 6. (a) shows a disengaged condition; (b) shows an engaged condition.

The difference between the second embodiment and the first embodiment is

that in the second embodiment, the coil fastener elements 10A are attached along the edges of the tapes 12A as in the case of previously known fasteners. The second embodiment, however, differs from previously known fasteners in that, as shown most graphically in FIG. 7, the edges of the tapes of the second embodiment are not joined on the same plane but are joined one above the other.

In all other aspects, the construction of the second embodiment (including the slider 20A) is the same as that of the first embodiment. As such, the same codes used in the first embodiment are used to represent the parts of the second embodiment with a character "A" added to each, and detailed explanations are dispensed with.

The first and second embodiments explained above use coils as fastener elements, but it is also possible to use rows of teeth.

EFFECTS OF THE INVENTION

According to the present invention, fastener elements 10, 10A are joined one above the other. Therefore, the elements can be attached not only at the edges of the fabrics but at locations other than the edges. As a result, the slide fastener has fewer limitations as to where it can be attached and has much wider applications.

According to the first embodiment, the fastener elements 10 have a special effect of not being visible from outside. Therefore, by choosing an appropriate fabric for the tape, it is possible to provide the fastener with a waterproofing feature.

The second embodiment produces a special effect in that, although the fastener elements 10A can be seen from outside, the tapes do not overlap one above the other, so it is easier for the slider to move up and down.